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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/723,533

11/26/2003

Anandaroop Bhattacharya

111079-135105

8659

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7590

11/18/2005

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EXAMINER

CHERVINSKY, BORIS LEO

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

**Office Action Summary**

Application No.

10/723,533

Applicant(s)

BHATTACHARYA ET AL.

Examiner

Boris L. Chervinsky

Art Unit

2835

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the heat spreader must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 9-16, 18-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozmat in view of Dessiatoun et al and further in view of Wirtz or alternatively in view of Weber et al.

Ozmat discloses the cooling device for the integrated circuit 3, 9 coupled to substrate 11 including the thermal management device comprising an aluminum case 17 that has a cavity (see Fig. 3) enclosing the porous medium 19 that is bonded to the case 17 (col.3, lines 61-63) and cooling fluid such as water circulating through the porous medium in the case, and there is a watertight seal between the case and the integrated circuit; the porous medium is the metal foam made of copper or aluminum (col. 3, lines 44-49), the thermal interface 13 is coupling the integrated circuit to the case 17. Ozmat discloses the claimed invention except the heat exchanger and the pump. Dessiatoun discloses the thermal management device including the heat exchanger 36 and the pump 38, the inlet coupled to the pump and the outlet coupled to the heat exchanger. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include the heat exchanger and the pump as disclosed by Dessiatoun in the device disclosed by Ozmat for cooling and circulation of the cooling medium for efficient heat removal. Ozmat discloses the claimed invention but does not specifically indicate

that the porous medium is micro-porous. Wirtz and Weber disclose the thermal management device having microporous medium and Wirtz discloses the size of the pores to be approximately 0.5-1.5 mm. as claimed in claim 6. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use micro-porous medium as disclosed by Wirtz or Weber in the device as disclosed by Ozmat. The method steps of claims 20-25 are necessitated by the device structure as disclosed by Ozmat in view of Dessiatoun and Wirtz; in reference to claim 25 the fluid flow is inherently partially induced by natural buoyancy resulting from either capillary attraction or vapor/condensation process as result of applied heat.

The details drawn to the size of the porous medium and the integrated circuit (claim 19) would have been an obvious at the time the invention was made to a person having ordinary skill in the art, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). The intended use the cooling device for an entertainment unit, disk player or networking interface is obvious since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozmat in view of Dessiatoun et al and further in view of Wirtz or alternatively in view of Weber et al. and further in view of Pokharna et al.

Ozmat discloses the claimed invention except various sizes of the pores in different areas of the porous medium and porosity at or above 80%. Pokharna discloses porous material used for cooling device having variable porosity in the range of 90% (col.5, lines 30-33).

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozmat in view of Dessiatoun et al. and further in view of Wirtz or alternatively in view of Weber et al. and further in view of Layton et al.

Ozmat discloses the claimed invention except epoxy sealant. Layton discloses the watertight case that includes the epoxy sealant 13a. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the epoxy sealant as disclosed by Layton et al. in the device disclosed by Ozmat in order to provide reliable seal between the case and the integrated circuit.

### ***Response to Arguments***

6. Applicant's arguments filed 09/29/05 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Wirtz discloses the porous medium that allows sufficient airflow and heat absorption at the same time

which is, as appears to be, the main purpose of the device disclosed by Ozmat, therefore the combining these two references is proper.

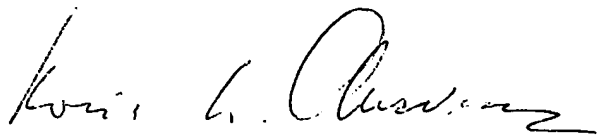
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Boris L. Chervinsky whose telephone number is 571-272-2039. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on 571-272-2800 ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**BORIS CHERVINSKY  
PRIMARY EXAMINER**



11/16/5